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ABSTRACT

This study examined workplace correlates (departmental and college) of scholarly performance in 296 college faculty members from 67 schools of pharmacy in the United States. The study estimated a model of 3-year scholarly performance through the exploration of six sets of correlates: demographic; affiliation; collaboration; research experiences and orientation; department; and college variables. Data obtained through self-reports shows that approximately one quarter of the respondents had published no refereed articles and the average faculty member published slightly over one article per year in the last 3 years; a finding not much different than other faculty populations, yet still slightly under national averages. Positive correlates of scholarly performance by pharmacy faculty were shown to be time spent in research and in collaboration with colleagues. However, department chair support, college resource support factors, and to a lesser extent, demographic characteristics and prior research experience and orientation seemed to be of less influence on scholarly work. Overall, the study concluded that the profile of a typical scholar in pharmacy is of an individual who spends substantial time on research (as high as 40 percent), contacts others about research both outside and within his/her college, receives personnel support, is tenured and experienced, works in a pharmacy college located in an academic health center, and has a chairperson supportive of scholarly activities. (Contains 38 references.) (GLR)

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WORKPLACE CORRELATES AND SCHOLARLY PERFORMANCE OF CLINICAL PHARMACY FACULTY

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ASSOCIATION FOR THE STUDY OF HIGHER EDUCATION

This paper was presented at the annual meeting of the Association for the Study of Higher Education held at the Marriott City Center, Minneapolis, Minnesota, October 29 - November 1, 1992. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

WORKPLACE CORRELATES AND SCHOLARLY PERFORMANCE OF CLINICAL PHARMACY FACULTY

ABSTRACT

The workplace, especially the academic department or division, as well as the larger college unit provides an intriguing research site for study of correlates of scholarly performance. The objective of this study was to estimate a correlate model of three-year scholarly performance of clinical faculty in schools of pharmacy. Two-hundred and ninety-six clinical faculty in pharmacy responded to an author-developed questionnaire. The scholarly performance items factored into three dimensions, "Refereed Research," "Federally-funded Research," and "Non-research Communications." A fourth single-item variable, "Contracts," was also used as a dependent dimension. Nine correlates, including two related to the department and college workplace emerged as factors significantly explaining the variation in scholarly performance. The two most significant were "Collaboration: Off-Campus Conversations," and "Department: Percent Time in Research." These results as well as others were contrasted with prior correlate studies and suggestions were made for future additional study.

WORKPLACE CORRELATES AND SCHOLARLY PERFORMANCE OF CLINICAL PHARMACY FACULTY

Introduction

Scholarly performance of faculty has been widely discussed in the literature and is recognized as a primary means of achievement and reward within the academy. Four perspectives have guided investigations explaining differential faculty publication rates: personal and individual characteristics such as psychological traits, work habits, and demographic factors; feedback processes such as "reinforcement" and "cumulative advantage"; discipline norms such as acceptable forms of scholarly communication in journals or books; and workplace factors such as prestige and collegial support within academic departments. (Creswell, 1985; Fox, 1985).

The workplace, especially the academic department or division, as well as the larger college unit provides an intriguing research site for additional correlate study. Aside from departmental prestige (Allison & Long, 1990) and colleague collaboration (Braxton, 1983), the academic department remains largely unstudied. Despite substantial study of chairpersons in recent years (Bennett & Fugili, 1990; Creswell, Wheeler, Seagren, Egly, & Beyer, 1990; Tucker, 1984), the supportive role of chairs as a distinct correlate of faculty performance has yet to be empirically examined. At the college level, the resources implied in the "cumulative advantage" hypothesis, and available from college sources need to be specifically isolated for study. Departments and the college become the workplace for

faculty and could be hypothesized to exercise considerable influence on scholarly performance.

This study explores the relative influence of departmental and college correlates of faculty scholarly work. The objective of the present study is to estimate a model of three-year scholarly performance of clinical faculty in the entire population of sixty-seven schools of pharmacy in the United States. The model explores six sets of correlates: demographic, affiliation, collaboration, research experiences and orientation, department, and college variables. By studying schools of pharmacy, we control for spurious effects of disciplinary norms. By examining three-year performance, we hold constant effects of a historical accumulation of scholarly work. The end-result is an original data set about scholarly performance of clinical faculty in pharmacy, reliable indices of chair and college support and scholarly performance, and a better understanding of potential contributions of departmental and college workplace correlates.

Review of Related Literature

Two areas of inquiry explored in recent years are the scholarly performance of faculty in professional education, particularly health professions faculty, and the influence of the faculty work environment on scholarly performance. The first domain represents research mapping the correlates operative in different professional discipline fields. These studies emerged from a perceived need of professional educators to improve the scholarly performance of faculty who were hired from practitioner, service-oriented settings. Researchers sought to identify the key correlates associated with high research performance. Studies found in applied fields such as library science, education, theological education, and

the health professions illustrate this line of investigation. This review will be delimited to the health professions since pharmacy faculty are the only professional group represented in the present study.

Studies about the faculty work environment represent a more loosely organized body of literature. Emerging from a keen interest in the day-to-day context in which faculty work, they have explored the correlates of prestige of institutional affiliation (e.g., Long & McGinnis, 1981), support for research at a college-level (e.g., Hough, 1987; Landers, 1986), and departmental prestige, leadership, and forms of collegial networks. Since faculty work is largely conducted within a departmental context and since this context has been understudied as a correlate, this literature review focuses on the few studies about departmental prestige, forms of departmental colleague support, and the chairperson's role in enhancing research performance.

Correlate Studies in Health Sciences

A variety of studies investigating correlates of scholarly performance in the health sciences disciplines (nursing, medicine, dentistry, pharmacy, and allied health) are summarized in Table 1. A number of recurrent of themes emerged from these studies.

Insert Table 1 Approximately Here

Faculty with greater amounts of educational and research preparation exhibited higher levels of performance (Flanigan et al., 1988; Harrington & Levine 1986; Kraemer & Lyons, 1989; Krumland, Will & Gorry, 1979; Nieswiadomy, 1984; Ostmoe, 1986; Parham, 1985). More

productive faculty also spent greater amounts of their time in research (Calligaro et al., 1991; Harrington & Levine 1986) and administrative (Megel, Langston & Creswell, 1988; Holzemer & Chambers, 1988) activities. In contrast, higher teaching (Harrington & Levine, 1986; Megel et al., 1988; Ostmoe, 1986) and clinical practice (Harrington & Levine, 1986) workloads had negative effects on scholarly performance. Finally, higher performing health sciences faculty had greater interest in research (Harrington & Levine, 1986; Megel et al., 1988; Ostmoe, 1986), and were more likely to have received academic promotion and tenure (Flanigan et al., 1988; Holzemer & Chambers, 1988; Kraemer & Lyons, 1989; Nieswiadomy, 1984; Parham, 1985) than lower performing faculty.

A major limitation of much of this work has been that few of the studies were designed around a conceptual framework or tested a model of scholarly performance. An exception to this practice was the study by Megel et al. (1988) which evaluated a model based on the correlates domains advanced by Fox (1983) and Creswell (1985). The present study builds on previous work by estimating a model adapted from the Megel et al. (1988) study.

Departmental Workplace Correlates

Allison and Long (1990) studied 179 job changes by academic chemists, biologists, physicists, and mathematicians. They found that publication and citation rates increased after faculty members relocated to more prestigious departments. In contrast, publication and citation rates declined for scientists who made downward moves to less prestigious units. Prestigious departments enhanced scholarly work because of the rich source of colleagues that valued and engaged in scholarship. Braxton (1983), for example, found that

departmental colleague career publications had a substantial influence on an individual's research productivity, especially when an individual's prior record was low. Thus, departmental colleagues either stimulated or repressed a faculty member's level of productivity. Baird (1986) also found that faculty ratings of the scholarship of other faculty, the prestige of the department, student rating of an emphasis on training researchers, and the overall research activity of faculty explained annual departmental journal publication rates for chemists, historians, and psychologists. At a broader level of analysis, a review of characteristics of research-conductive environments by Bland and Ruffin (1992) concluded that twelve were operative: clear goals that served a coordinating function; a research emphasis; a distinctive scholarly culture; a positive group climate; assertive participatory governance; a decentralized organizational structure; frequent communication; accessible resources, particularly human; sufficient size, age, and diversity; appropriate rewards; concentration on recruiting and selecting scholars; and leaders who had expertise as researchers and used participatory management practices.

Recent studies have focused on chairpersons as leaders and their efforts to encourage scholarly work. Chairs can facilitate scholarly writing. Boice (1988) outlined practical means by which chairs encouraged writing through forming discussion groups, modeling ideal writing habits, fostering communication with faculty, and holding writing workshops. Friedrich (1985) offered suggestions to speech communication department chairs about how to create a healthy departmental climate for scholarship. He recommended that chairs need to set realistic expectations, make scholarly initiatives departmental ones, begin with areas where chances of success are high, and individualize approaches for faculty. A qualitative

study mapped the possible roles for chairs as individuals who enhance and support faculty research. Creswell and Brown (in press) developed a grounded theory of chair support and identified through thirty-three interviews the administrative roles of providing resources and allocating time for scholarly work. Chairs also advocated, promoted, and publicized faculty who improved their scholarship, and chairs engaged in the interpersonal roles of mentoring, collaborating, encouraging, and challenging faculty.

Research about the departmental workplace, then, has focused on prestige factors, colleague support, an environment conducive to research, and more recently, on the roles and behaviors of academic chairpersons. These studies, however, provide little insight into the relative role of departments, chairs, or the workplace environment of faculty when compared with other correlates drawn from the theoretical explanations of individual, psychological, "cumulative advantage" and "reinforcement" hypotheses.

Methods

The study population consisted of 466 clinical faculty members who held full-time, 1990-91 academic appointments in sixty-seven colleges of pharmacy with departmental or divisional structures in the United States. The study population included only individuals holding the Doctor of Pharmacy (Pharm.D.) as their highest academic degree and faculty who had held appointments at their present college for at least three years.

The model tested in this study is shown in Figure 1. The correlates for this model

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Insert Figure 1 Approximately Here

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were drawn from several large-scale predictive models of research performance available in the literature (Blackburn, Behymer, & Hall, 1978; Bean, 1982; and Megel et al., 1988; Knorr et al. 1979; Reskin, 1979). Because the Megel, Langston, and Creswell model (1988) was tested in another field of the health sciences, nursing, it was adapted and modified for the present study of pharmacy faculty. Individual and feedback processes, included in the Fox (1985) discussion of correlates were combined with departmental and college factors in this study's model and in survey items sent to the pharmacy faculty. As seen in Figure 1, the full model included exogenous variables - demographics, affiliation, collaboration, and prior research experience/orientation, and endogenous departmental and college factors. For the "Chair Support" constructs, faculty were asked to rate their department/division chairperson on twenty-one items of support identified in the qualitative study by Creswell and Brown (in press). In addition, respondents reacted to sixteen items about resource support provided by their colleges of pharmacy. The scholarly performance measures reflected performance over the last three years - to control for confounding interaction effects of career experience or age (Bayer & Dutton, 1977), and they included eleven items ranging from non-research publications and presentations to contracts and federal grants. The five-page survey, operationalizing the variables in the model, was designed by the authors, and it included continuous and categorical scales. A single open-ended question was placed in the instrument asking respondents to indicate what factors might inhibit their scholarly performance.

Data analysis of the responses included checks for response bias and descriptive statistics to determine central tendencies. Items scores were converted to z-scores so that

single items could be combined, and initial principle axis factoring with the Kaiser criterion and Cronbach reliability checks wee used to develop reliable indices for chair support, resource support and scholarly performance. A correlation matrix was produced to test all variables for multicollinearity. The model (in Figure 1) was estimated by using regression analysis on the full model with blocked variables entered separately into the equations followed by regressions on reduced models using forward inclusion to account for the most salient correlates explaining variation in the four scholarly performance variables. Finally, to utilize the open-ended qualitative data about factors that inhibited faculty from becoming better researchers, the top and bottom 10% of faculty on the most reliable construct "Refereed Research" (N=27 for Poor Performers and N=30 for Exceptional Performers) were selected and a bar histogram developed to display triangulated quantitative and qualitative information about significant correlates. Textual quotes about factors inhibiting research in the two groups of performers were related to significant correlates and included in the bar histogram.

Results

Exogenous Descriptive Results

The response rate was 63.5 percent with 296 useable returned questionnaires after four mailings. A follow-up analysis on returns by comparing early and late respondents indicated no potential response bias. Women respondents comprised 33.4% and men, 66.6% of the respondent pool. The average age for clinical faculty was 37.6 years with a range of 28 to 59. The average year for receipt of their Pharm.D. degree was 1979 (S.D.=4.9 years), and three-quarters (77%) held post-B.S. Pharm.D. degrees. They had

been employed as a college of pharmacy faculty member on an average of 9.45 years (S.D.=5.3). Approximately two-thirds held tenure or were in tenure-track positions. In terms of affiliation, the clinical faculty received an average of three-quarters of their salary from college of pharmacy sources. Almost 70 percent of the faculty were employed at colleges of pharmacy located within an academic health sciences center. When asked about conversing with individuals about their research or the other person's research "outside" the parent institution, the respondents averaged about two calls per week (mean = 2.3, S.D. = 4.0).

The respondents were also asked to answer questions about their past training, research experience and their overall research orientation. Slightly more than half had completed a research project during their Pharm.D. degree (51.4%). Sixty-eight percent had completed residency training, and these individuals spent an average of 14 percent of their residency in research activities. A smaller percentage, twenty-four percent, had completed one to three years of fellowship training, and had spent an average of sixty-eight percent of their time on research activities. On the average, the faculty were slightly more interested in research (56.8%) than in teaching (43.2%).

Endogenous Descriptive Results

Departmental and college endogenous variables were represented by factor constructs and single item variables. Respect/support for research consisted of a five-item construct (alpha = .50) measuring support in the department for research. The respondents were also asked to estimate the percentage of time in a typical year that they devoted to research activities such as conducting research, writing grants, and writing manuscripts. The average percentage was roughly one-fifth (20.4%) with considerable variance (S.D. of

16.25%). Through factor analysis a twenty-one item battery of chair support items were reduced to four factors (with eigenvalues equal to or greater than 1.0) and two single item variables. These are shown in Figure 2, and the reliability alphas ranged from .53 to .84.

Insert Figure 2 approximately here

The items loaded on factors labeled "Information Support," "Administrative Support," "Collegial Support," and "Mentoring Support." Single-item support variables were how chairs "Let Faculty Set Own Agenda" (mean=4.2, S.D.=.85 on a 5-point Likert scale), and chairs support through "Funding for Meetings" (mean=3.6, S.D.=1.2).

Turning to college variables, college research expectations were based on a single question asking respondents to consider whether faculty members must be productive researchers to receive tenure at the college. Respondents confirmed that overall an expectation was in place (mean=3.9, S.D.=1.1) in their colleges of pharmacy. Colleges resources were measured by sixteen items that collapsed into five factors with modest to high reliabilities: "Financial Resource Support" (alpha=.67), "Personnel Resource Support" (alpha=.69), Physical Facilities Support" (alpha=.82), "Research Site Resource Support" (alpha=.84), and "Research Collaborators Resource Support" (alpha=.60).

Scholarly Performance Measures

Self-reported information about the number of scholarly works during the last three years was provided by the respondents. In terms of descriptive information, the clinical pharmacy faculty published slightly over one refereed journal article per year for the last

three years (three year total = an average of 4.5 articles, with S.D.= 6.1), and 23 percent had not published any articles. They authored far less than one book during the three year period (mean=.26, S.D.=.81), but were active in national meetings in research presentations (average of 4.5 during three year period with S.D.= 6.8). Only 16.6 percent had received a funded federal grant from agencies such as NIH, NSF, Department of Education, and the Department of Defense. Through factor analysis, the items loaded heavily on three factors with eigenvalues of 1.0 or greater. "Refereed Research" emerged as a dimension consisting of refereed journal articles, foundation and pharmaceutical company grants, and research presented at national meetings (alpha=.77), "Federally-funded research" consisted of grants approved and funded (alpha=.77), and "Non-research Communications" was comprised of measures such as non-research articles, non-research presentations, and books (alpha=.52). Non-investigator-initiated or peer-reviewed "Contracts," was entered in subsequent regression equations as a single item variable.

Regression Analysis

A preliminary step to regression was to calculate the correlation coefficients among all variables in the model of Figure 1. Multicollinearity was ruled out as a possibility since none of the correlations reached a coefficient of .80 or above. The four scholarly performance variables were regressed against blocks of variables entered separately in the full model. From this analysis, the dependent scholarly performance constructs and variables were regressed against a reduced set of nine exogenous and endogenous variables (with significance F-ratios at or less than .01).

As shown in Table 2, the most variation explained by any set of correlates for the

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of four performance measures was 34 percent (with a range from 16 to 34). That different correlates significantly entered the equations suggested that variation in scholarly performance is explained by correlates that differ depending on the type of performance. Variables or constructs from all six blocks were represented in statistically significant correlates in the regression models. The influence of department and college correlates, as hypothesized, explained variation in scholarly work, but they were not always the most significant factors entering the equations.

Only one correlate, "Collaboration: Off-Campus Conversations," entered all four performance equations. The scholarly performance index, "Refereed Research," not only had the most reliability, it also was explained best by correlates drawn from several "blocks" in the model, the department, the college, personal research orientation, and collaboration. Of all correlates in the model, "Department: Percent Time in Research," explained the most variation in "Refereed Research," "Federally-Funded Research," and "Non-Research Scholarship." This correlate, coupled with "Collaboration: Off-Campus Conversations," provide a modest explanation for variation in several types of scholarly performance of clinical pharmacy faculty.

Outlier Cases

In order to draw a sharper picture of these correlates, the top 10% and the bottom

10% of respondents on "Refereed Research" were selected and bar histograms drawn on the nine correlates that entered significantly the regressions for the four scholarly performance measures. Z-score conversions provided a basis for comparing the histograms on all nine variables or factors. In addition, an open ended question on the survey about factors that inhibited scholarly performance produced quotes for qualitative information to support the quantitative measures. As shown in Figures 3, this mixed method histogram showed

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that three correlates, "Percent Time in Research," "Off-Campus Conversations," and "Research Orientation" clearly differentiated between the Exceptional and the Poor Performers, thus providing visual support for the regression findings. Further, important information can be drawn from noting the correlates about which the faculty commented or did not comment. A mixed picture emerged from this analysis. On the one hand, both Poor and Exceptional Performers commented about "Collaborator Support," and "Personnel Support," yet neither was a factor that clearly differentiated the two groups. No comments were made about "Off-Campus Conversations," and yet this factor showed empirical support for differences between the two groups. From this picture, one might conclude that faculty, at least Poor Performers, may not be aware of factors that inhibit their scholarly performance and settle on tangible factors such as colleagues, secretaries and graduate students as important aids needed to improve their research. Finally, within correlate quotes are enlightening, too. Both Poor and Exceptional Performers report that other duties

constrain the time they can allocate to research ("Percent Time in Research"). Poor Performers made several comments about "poor rewards," "useless" research and a desire to focus on teaching. Exceptional Performers saw little need to comment about the value of their scholarly orientation.

Discussion

At one level of analysis, this study provided information about a population of faculty, clinical faculty in pharmacy, for which we do not have systematic information about scholarly productivity. To find in this study that approximately one quarter had published no refereed articles and the average faculty member published slightly over one article per year in the last three years pointed to publication rates consistent with other faculty populations. For example, nursing educators with a doctorate published an average of 2.3 research articles in the last three years, but almost a third had published no articles (Megel, et al., 1988). In medicine, faculty have averaged about two articles per year in two separate studies (Krupland et al., 1979; Manu et al., 1985). For faculty from many different disciplines, thirty-one percent of the respondents to the Ladd and Lipset Survey of the American Professoriate had published from zero to four journal articles during their careers (Ladd & Lipset, 1978). For faculty from all disciplines in four national surveys, Bentley and Blackburn (1990) found that faculty two year publication rates varied from 2.6 (in 1969) to 3.1 (in 1988). This information suggested that clinical faculty in pharmacy are publishing at slightly under national averages in the most recent survey, slightly ahead of nursing in the health sciences and perhaps slightly behind faculty in medicine. The fact that a large percentage are unpublished confirmed reports from other fields of study, leading one to

believe that a few highly prolific, major contributors dominate the publishing in pharmacy like in other fields (Price, 1963).

The overall amount of variance explained by correlates in the model was considerably less than expected (Blackburn, Behymer & Hall, 1978 found 60% of article productivity explained by similar variables). Variables not accounted for in the model were operative within this health sciences context. Of those variables that significantly explained variation in scholarly work, the amount of time that faculty spent in research has been well-documented both in health sciences and in other disciplines as a positive correlate of scholarly work (e.g., Megel, et al., 1988; Wanner, Lewis & Gregorio, 1981). Less attention has been given to collaboration in the form of communication with other scholars, but the results have been positive (e.g., Blackburn, Behymer & Hall, 1978), especially in the case of communications with other researchers off-campus. Thus both the "cumulative advantage" of time and the "reinforcement" of colleagues, as explanations, impact the life of a productive pharmacy faculty member.

In the larger model under study (Figure 1), departmental chair support and college resource support factors, and to a lesser extent prior research experience and orientation as well as demographic characteristics exercised less influence on scholarly work than we had hypothesized. This finding is contrary to earlier studies in health sciences (Harrington & Levine, 1986; Krumland et al., 1979; Nieswiadomy, 1984; Ostmoe, 1986) that indicate the importance of prior research training and experiences in enhancing faculty scholarship. The differing results can be explained in that those previous studies tested a small number of correlates while the present study estimated a more comprehensive model.

The profile of a scholar in pharmacy seems to be an individual who spends time on research (approximately 40% for the Exceptional Performers), contacts others about research both outside and within their college, receives personnel support, is tenured and experienced, works in a pharmacy college located in a academic health center, and has a chairperson supportive of scholarly activities.

The role of the chair and the larger college support services for scholarly work remain less a force in enhancing scholarly work than we had hypothesized. A potential missing element in the present study is the governance system in place in departments and colleges of pharmacy wherein chairs provide support and colleges allocate resources. Knowledge about these systems, such as the relative authority (e.g., personal, professional) of the chairperson, can identify his or her impact on the work of others within the unit. This line of inquiry appears to be especially amenable to qualitative designs such as case studies where one might track the scholarly career of the clinical pharmacist and refine the items measuring the role of colleagues and chairs in a faculty member's unfolding (or declining) research efforts. Moreover, taking special note of faculty populations, faculty with different status, such as part-time or pre-retirement staff, might be studied to see if they confirm or disconfirm the patterns identified in this present study. In addition, even though we know that productive scholars in pharmacy spend time on their scholarly work, we know little about how they received or made the assignment that freed time from other pressing activities. As they communicate with others about their research, we need more information about the stimulus for this communication, and how it interacts with establishing networks of specialists who, working independently, advance scientific information. This knowledge

may help identify correlates explaining more variation in performance rates.

These limitations and future research needs aside, this study provides original data about scholarly performance rates for clinical pharmacy faculty, operationalizes chair support and college resources as reliable indices for future correlate studies in other disciplines and across disciplines, and suggests a need for administrators to be conscious of approaches for creating time and enhancing those networks of scholarly communication essential for research. The overall test of the correlates model led us back to standard variables repeatedly mentioned in past literature, but reinforced concepts such as "cumulative advantage" and "reinforcement" in the health sciences setting. More work needs to be done testing large-scale predictive models, and models that provide a better understanding of special fields of study, like pharmacy, with a strong interest in enhancing the scholarly potential of their faculty.

References

Allison, P.D. & Long, J.S. (1990). Departmental effects on scientific productivity. American Sociological Review. 55, 469-478.

Baird, L.L. (1986). What characterizes a productive research department? Research in Higher Education. 25:3, 211-225.

Bayer, A.E. & Dutton, J.E. (1977). Career age and research-professional activities of academic scientists. Journal of Higher Education. 48: 259-282.

Bean, J. (1982). A causal model of faculty research productivity. A paper presented at the annual meeting of the American Educational Research Association, March, New York, New York.

Bennett, J.B. & Figuili, D.J. Enhancing Departmental Leadership: The Roles of the Chairperson. New York: American Council on Education/Macmillan Series on Higher Education.

Bentley, R.J. & Blackburn, R.T. (1990). Faculty Research Performance over Time: Its Relationship to Age, Career Age, and Rank. Unpublished paper. Ann Arbor, MI: University of Michigan.

Blackburn, R.T., Behymer, C.E. & Hall, D.E. (1978). Research notes: Correlates of faculty publications. Sociology of Education. 51:132-141.

Bland, C.J., & Ruffin, M.T. (1992). Characteristics of a productive research environment: Literature review. Academic Medicine. 67, 385-397.

Boice, R. (1988). Chairs as facilitators of scholarly writing. The Department Advisor. 3:4, 1-5.

Braxton, J.M. (1983). Department colleagues and individual faculty publication productivity. The Review of Higher Education. 6:2, 115-128.

Calligaro, I. L. S., Hutchinson, R. A., Hermann, D., Rucker, D. T., Batenhorst, R. L. (1991). Pharmacy research in academic institutions. American Journal of Pharmaceutical Education, 55, 40-45.

Creswell, J. W. (1985). Faculty Research Performance: Lessons from the Sciences and Social Sciences. (ASHE-ERIC Higher Education Report No. 4). Washington, DC: Association for the Study of Higher Education.

Creswell, J.W., Wheeler, D.W., Seagren, A.T., Egly, N.J. & Beyer, K.D. (1990). The Academic Chairperson's Handbook. Lincoln and London: The University of Nebraska Press.

Creswell, J.W., & Brown, M.L. (in press). How chairpersons enhance faculty research: A grounded theory study. The Review of Higher Education.

Flanigan, K. S., Ballinger, P. W., Grant, H. K., Bennett, D., Schiller, M. K., Waller, K. V., Jordan, L., Gierhart, J., Brodnik, M. P., Van Son, L. G., Testat, E. W. (1988). Research productivity profile of allied health faculty. Journal of Allied Health, 18, 87-100.

Fox, M.R. (1985). Publication, performance, and reward in science and scholarship. In J. Smart (Ed.) Higher education: Handbook of Theory and Research, (Vol. 1). New York: Agethon Press.

Fox, M. F. (1983). Publication productivity among scientists: A critical review. Social Studies of Science, 13, 285-305.

Friedrich, G.W. (1985). Renewing the Commitment to Scholarship. Paper presented at the Annual Meeting of the Speech Communication Association.

Harrington, M. S., & Levine, D. U. (1986). Relationship between faculty characteristics and research productivity. Journal of Dental Education, 50, 518-525.

Holzemer, W. L., & Chambers, D. B. (1988). A contextual analysis of faculty productivity. Journal of Nursing Education, 27, 10-18.

Hough, J.C. (1987). The dean's responsibility for faculty research. Theological Education. 24, 102-114.

Ladd, E.C. & Lipset, S.M. (1978). Technical Report, 1977 Survey of the American Professoriate. Storrs: Social Science Data Center, University of Connecticut.

Landers, T.J. (1986). Strategies for Increasing Scholarly Productivity in Schools and Colleges of Education. Paper presented at the Annual Meeting of the American Association of Colleges for Teacher Education.

Long, J.S., & McGinnis, R. (1981). Organizational context and scientific productivity. American Sociological Review. 46, 422-442.

Knorr, K.D., Mittermeir, R., Aichholzer, G., and Waller, G. (1979). Individual publication productivity as a social position effect in academic and industrial research units. In Frank M. Andrews (Ed.) Scientific Productivity: The Effectiveness of Research Groups in Six Countries. Cambridge: Cambridge University Press.

Kraemer, L. G., & Lyons, K. J. (1989). Research productivity in allied health faculty in academic health centers. Journal of Allied Health, 18, 349-359.

Krumland, R. B., Will E.E., & Gorry G. A. (1979). Scientific publications of a medical school faculty. Journal of Medical Education, 54, 876-884.

Manu, P., Landaw, S. A., Williams, W. J., & Schwartz, S. E. (1985). Analysis of publication output of internal medicine faculty members. Journal of Medical Education, 60, 860-864.

Megel, M. E. (1987). Nursing scholars, writing dimensions, and productivity. Research in Higher Education, 27, 226-243.

Megel, M. E., Langston, N. F., & Creswell, J. W. (1988). Scholarly productivity: A survey of nursing faculty researchers. Journal of Professional Nursing, 4, 45-54.

Nieswiadomy, R. M. (1984). Nurse educators' involvement in research. Journal of Nursing Education, 23(2), 52-56.

Ostmoe, P. M. (1986). Correlates of university nurse faculty publication productivity. Journal of Nursing Education, 25, 207-212.

Parham, D. (1985). Academic reward structures and occupational therapy faculty, Part II: Predictors of rewards and scholarly productivity. The Occupational Therapy Journal of Research, 5, 139-153.

Pearse, W. H., Peeples, E. H., Flora, R. E., & Freeman, R. (1976). Medical school faculty productivity. Journal of Medical Education, 51, 201-202.

Price, D. (1963). Little Science, Big Science. New York: Columbia University Press.

Reskin, B. (1979). Academic sponsorship and scientists' careers. Sociology of Education, 52, 129-146.

Tucker, A. (1984). Chairing the academic department: Leadership among peers. New York: American Council on Education - Macmillan Publishing Company.

Wanner, R.A., Lewis, L.S., & Gregorio, D.I. (1981). Research productivity in academia: A comparative study of the sciences, social sciences and humanities. Sociology of Education, 54, 238-253.

Table 1.
Summary of Scholarly Performance Correlates Studies Involving Health Professions Faculty

Study	Individual/Psychological	Cumulative Advantage	Reinforcement	Scholarly Performance Measures Studied
Niesviadomy (1984) Nursing		-Educational preparation -Appointment at institution offering higher levels of education	-Academic rank	-Past research studies conducted -Past research studies published -Ongoing research studies
Ostmoe (1984) Nursing		-Research preparation -Time in clinical instruction (neg)	-Research and publication interests -Current job socialization	-Weighted quantity publication score -Unweighted quantity publication score -Weighted quality publication score -Unweighted quality publication score
Hegel (1987) Nursing	-Writing skills			-Refereed research articles (last 3 years) -Refereed non-research articles (last 3 years)
Hegel, Langston, & Cresveil (1988) Nursing	-Motivation	-Coauthored papers with graduate school mentors -Time spent in administration -Time spent in teaching (neg)	-Preference for research -Publication prior to doctorate	-Research articles (last 3 years)
Holzemer & Chambers (1988) Nursing		-Time spent in administration	-Appointment in program with productive senior faculty -Academic rank -Positive perception of environment	-Publications (career and last 3 years) -Refereed articles (career and last 3 years) -Presentations (last 2 years)
Pearse, Peeples, Flora, & Freeman (1976) Medicine	-Age (bimodal publication peaks)			-Mean publications per year

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Krumland, Vill, & Gorry (1979) Medicine		-Educational preparation		-Publication count (last 3 years) -Adjusted publication count (last 3 years) -Weighted, adjusted publication count (last 3 years)
Manu, Landav, Williams, & Schwartz (1985) Medicine	-Age over 40		-Section productivity -Section chief productivity	-Mean number of publications per year
Harrington & Levine (1986) Dentistry		-Earned Ph.D. degree -Time in consulting -Time in research -Time in teaching (neg) -Time in clinical practice (neg)	-Interest in research -Number of journal subscriptions	-Career publications
Calligaro et al. (1991) Pharmacy		-Time in research		-Research publications per year -Review articles per year -Books per year -Book chapters per year
Parham (1985) Occupational Therapy	-Age (neg) -Gender (female-neg)	-Advanced academic degree -Position in Research II university (versus comprehensive) -Size of program (number of faculty) -Medical center location (neg)	-Academic rank	-Research article publication (yes or no) -Non-research article publication (yes or no)
Flanigan et al. (1988) Allied Health Fields		-Earned doctorate -Employed at 4-year research universities	-Rank of professor -Tenured	-Major papers -Research publications -Times served as a principle investigator -Time spent in research
Kraemer & Lyons (1989) Allied Health Fields		-Earned doctorate -Research assistants -Classroom teaching -Time in research	-Salary -Academic rank -Journal subscriptions -Collaborators	-Career publications -Publications (last 2 years) -Career books/monographs

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Table 2

Correlates of Scholarly Performance in Clinical Pharmacy Faculty Members

	Refereed Research				Federally-Funded Research				Non-Research Scholarship				Contracts			
Variable	Beta	R^2 Chg	Tot R^2	p	Beta	R^2 Chg	Tot R^2	p	Beta	R^2 Chg	Tot R^2	p	Beta	R^2 Chg	Tot R^2	p
Demographics: Experience as a Faculty Member									.29	.08	.08	.00				
Department: Percent Time in Research	.24	.21	.21	.00	.22	.10	.10	.00	.17	.08	.16	.00				
Collaboration: Off Campus Conversations	.28	.06	.27	.00	.17	.03	.13	.00	.18	.03	.19	.00	.33	.12	.12	.00
Department: Chair Hands-Off Support					-.16	.02	.15	.00								
Demographics: Tenure Status					-.13	.02	.17	.00								
College: Research Collaborator Support													.16	.03	.15	.00
College: Personnel support	.21	.03	.31	.00					.16	.03	.22	.00				
Orientation: Research	.22	.03	.34	.00												
Affiliation: Location of College									-.19	.02	.24	.00	-.14	.01	.16	.01

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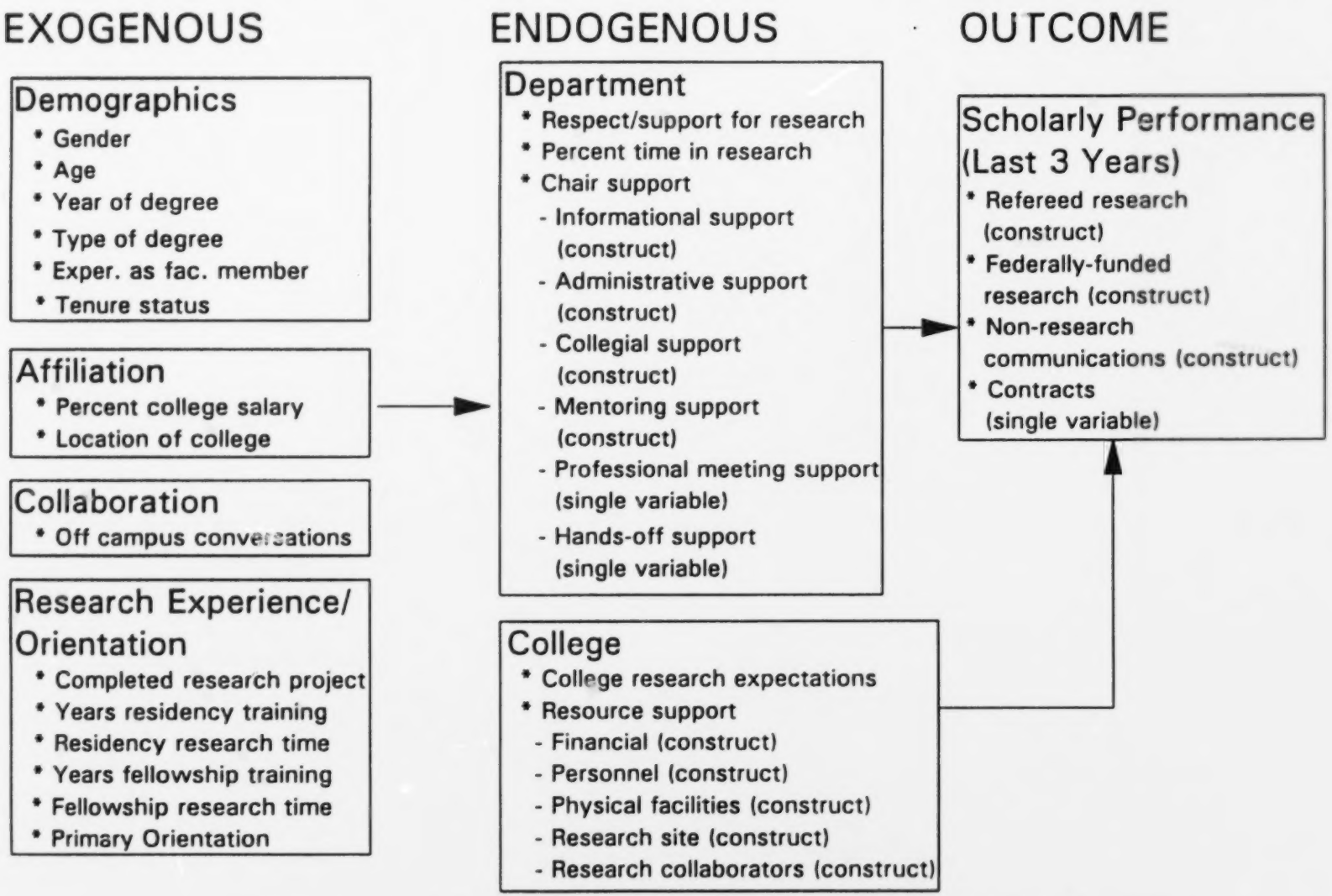

Figure 1. A Model Estimating Scholarly Performance Among Clinical Pharmacy Faculty

High
-"Other duties interfere"
-"Demands of teaching and service"
-"Lack of time to develop new skills"

Low -"Proper guidance for young faculty"
-"Need more hours in a day"
-"Involved in too many activities"
-"Student demands on time"

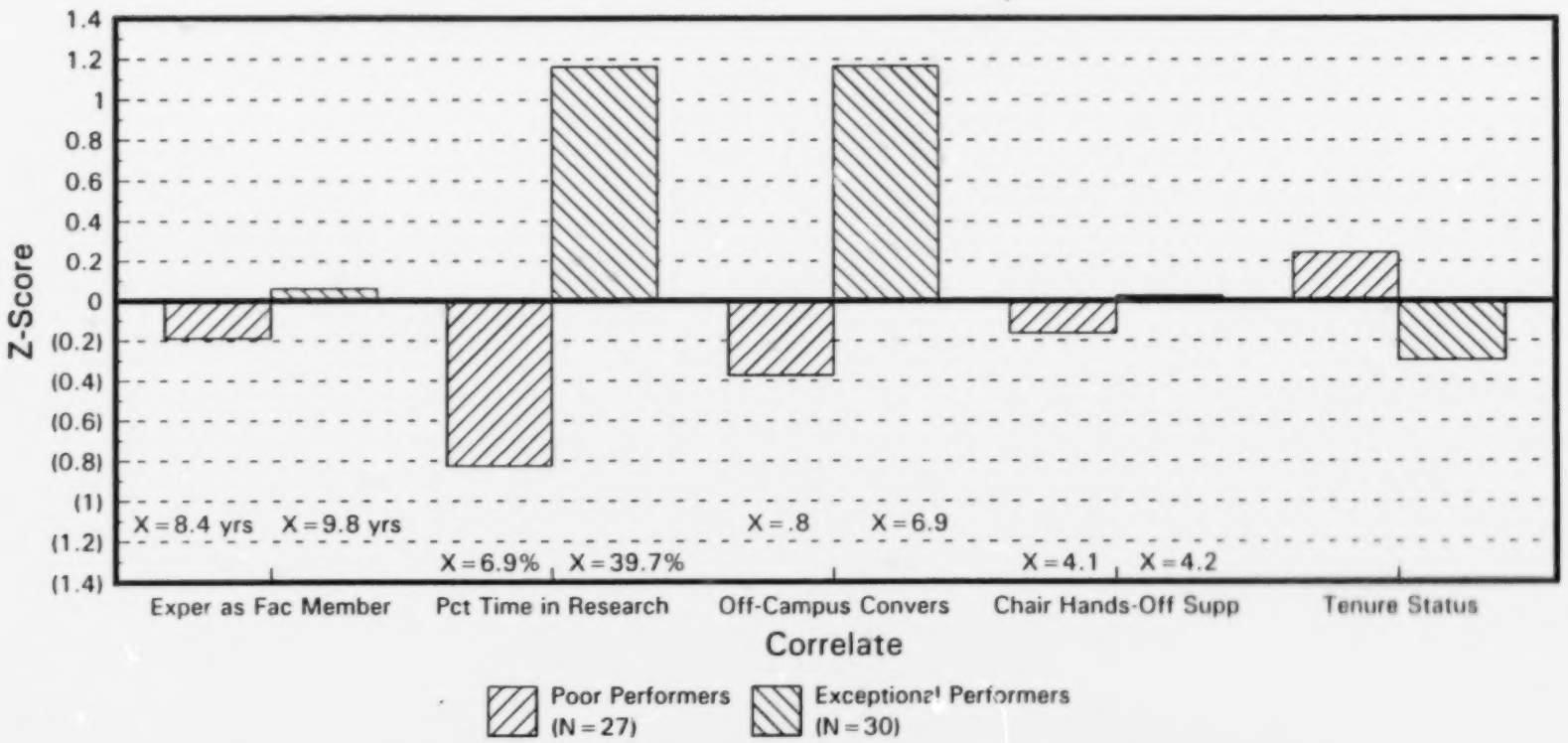

Figure 3. Comparison of selected correlates between the 10 percent highest and lowest performers in refereed research

High

-"Other duties interfere"
-"Demands of teaching and service"
-"Lack of time to develop new skills"

Low -"Proper guidance for young faculty"

-"Need more hours in a day"
-"Involved in too many activities"
-"Student demands on time"

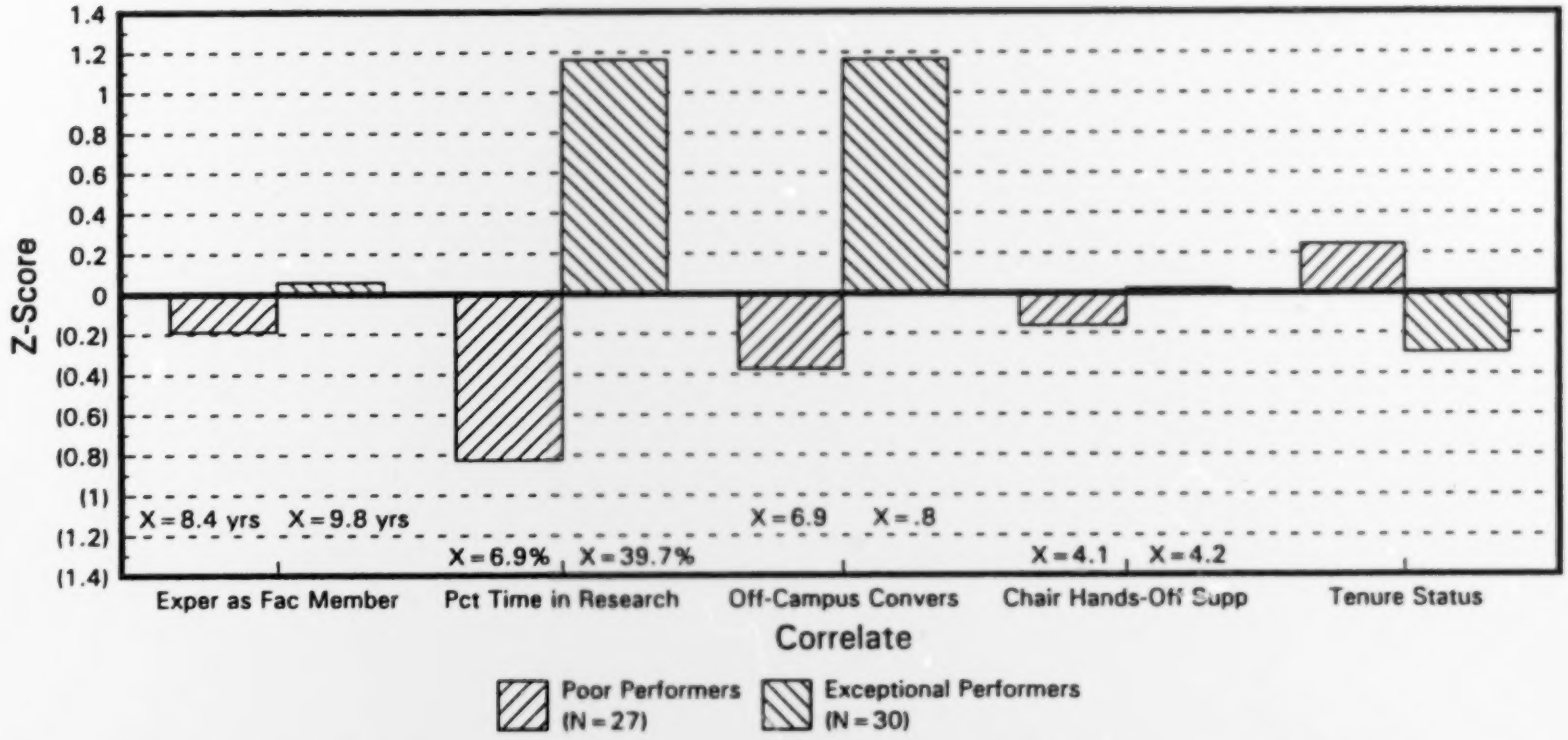

Figure 3. Comparison of selected correlates between the 10 percent highest and lowest performers in refereed research

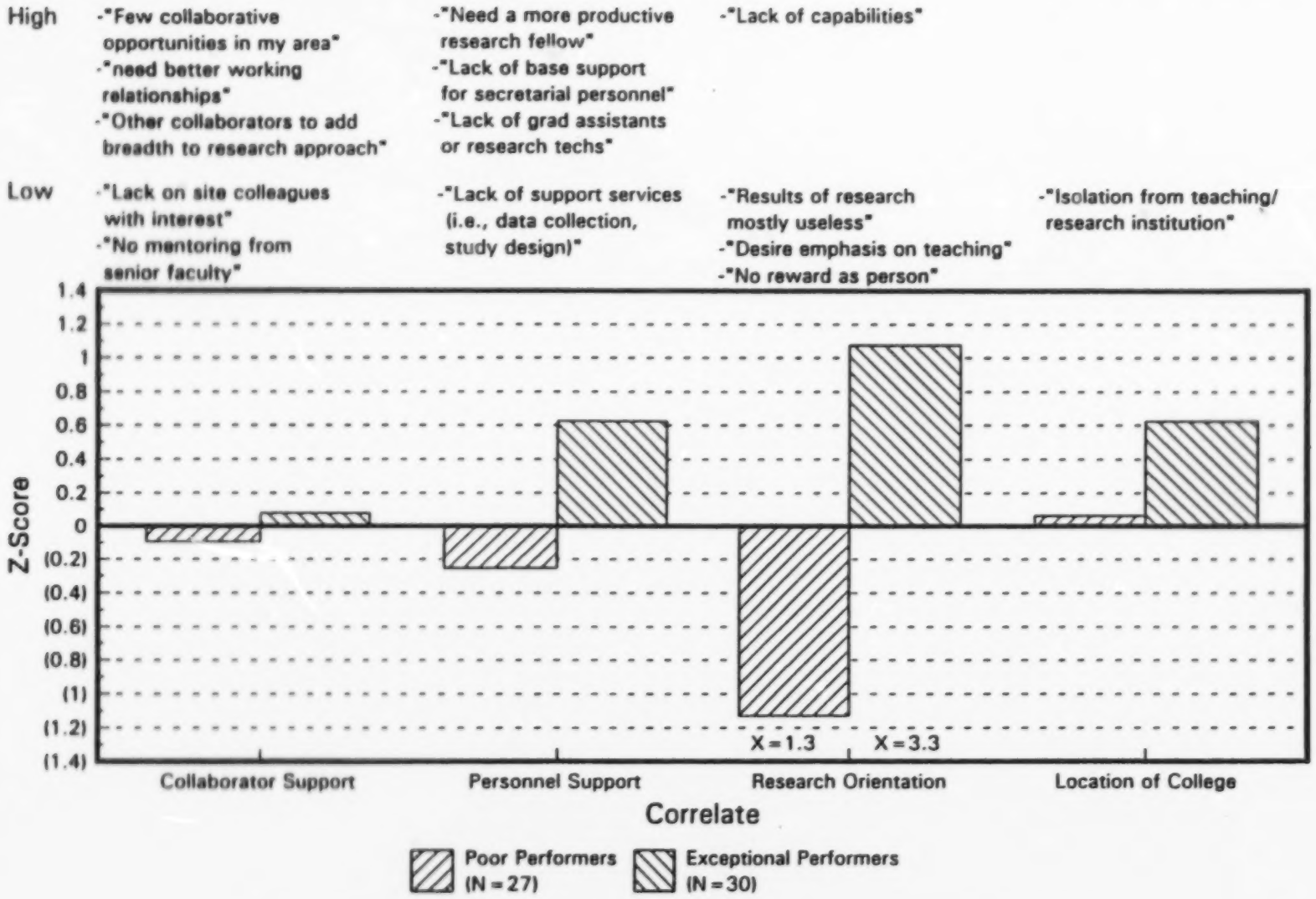

Figure 3 (Cont). Comparison of selected correlates between the 10 percent highest and lowest performers in refereed research